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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Jean Gobet

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EXAMINER

DIETERLE, JENNIFER M

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1795

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/586,668	Applicant(s) GOBET ET AL.	
	Examiner Jennifer Dieterle	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 9/22/09.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-32 is/are pending in the application.
- 4a) Of the above claim(s) 33-36 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

Claims 1-16 have been canceled.

Claims 17-36 are pending.

Claims 33-36 are withdrawn (see numerals 2 and 3 below concerning the election restriction).

Claims 17-32 are being examined.

Response to Amendment

1. Applicant's amendment of 9/22/2009 does not render the application allowable. In light of reconsidering the art, examiner withdraws previous rejections and offers the following rejections.

Election/Restrictions

2. Applicant's election with traverse of Group I, claims 17-32, in the reply filed on 9/22/2009 is acknowledged. The traversal is on the ground(s) that it would not be a serious search burden on the examiner to search both Group I and II. This is not found persuasive because the restriction is based on unity of invention and the inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features. Both Groups I and II share the feature of a electrically conducting

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substrate and as stated, Butler (US 4,062,750) teaches an electrochemical cell and electrode system comprising an electrically conductive substrate (col. 1, lines 5-7; col. 7, lines 58-64). Therefore, the common feature between both groups, an electrically conducting substrate, does not provide a contribution over the prior art, and, thus, cannot be a special technical feature. Therefore, Groups I and II do not relate to a single inventive concept under PCT Rule 13.1.

The requirement is deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 17, 18, 29 and 30 are rejected under 35 U.S.C. 103(a) as being obvious over Urban et al. (WO90/12314, all citing will be to PTO translation PTO/96-4882).

Regarding claim 17, Urban et al. teach an electrode system for an electrochemical cell comprising (pages 13-15):

- an electrically conductive substrate 2 (fig. 10);
- an electrically insulating layer deposited on the substrate 4 (fig. 11) and pierced with a circular orifice (fig. 11);
- an electrically conductive layer 1 (fig. 10) deposited in said orifice being formed of microdisks (see fig. 11); and
- an electrically conductive layer 3 deposited on the insulating layer 4,4', pierced with circular orifice of larger diameter than that of the microdisks 1 and arranged such that each orifice is concentric with a microdisk, said layer forming a generating electrode 3 (fig. 10,12).

A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458,459 (CCPA 1963). Therefore, “generating and measuring” are intended use of the electrodes.

Additionally, during patent examination, the pending claims must be “given their broadest reasonable interpretation consistent with the specification.” The Federal Circuit’s en banc decision in *Phillips v. AWH Corp.*, 415 F.3d 1303, 75 USPQ2d 1321 (Fed. Cir. 2005)(MPEP 2111). During examination, the claims must be interpreted as broadly as their terms reasonably allow. *In re American Academy of Science Tech Center*, 367 F.3d 1359, 1369, 70 USPQ2d 1827, 1834 (Fed. Cir. 2004)(MPEP 2111.01 I). Therefore, the term “substrate” is claimed as an electrically conducting material and numeral 2 in figure 10 of Urban et al. is an electrically conducting material.

While Urban et al. does teach a plurality of cavities (figures 1 & 4), Urban et al. does not specifically teach a plurality of cavities for the figures comprising multiple layers referred to above (figures 10-13).

The court has held that the mere duplication of parts has no patentable significance unless a new and unexpected result is produced. See *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960); MPEP 2144.04 VI B. Therefore, it

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would have been obvious to one skilled in the art to provide for multiple cavities in the substrate of Urban et al. because the mere duplication of cavities will still perform analysis without any new or unexpected results.

Regarding claim 18, Urban et al. teach in figure 12 that the insulating layer 4' that is pierced by a plurality of circular apertures has a diameter smaller than the cavities and is formed on the substrate 2.

Regarding claims 29 and 30, Urban et al. teach an electrode device that meets the limitations specified in applicants' main independent claim. Therefore, it is inherent that the electrode of Urban et al. has a thickness allowing it to constitute, around and above the microdisks, a confinement volume protected from a hydrodynamic flow of a solution to be treated.

4. Claims 19, 22-25 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Urban et al. in view of Sugihara et al. (US 5,810,725).

Regarding claims 19, 22 and 23, Urban et al. teach an electrode system for an electrochemical cell that has a thin metallization layer 1 formed on the bottom of each cavity that has a diameter substantially the same as that of the aperture 4,4' (fig. 12), but does not teach the option of a thick metallization layer at least partially filling each cavity.

Since applicants refer to the thick metallization layer as "optional," this language does not make the thick metallization layer necessary. Claims 19 (and thus claim 22) only further limit claims 17 and 18 when the thick metallization is not an "optional" feature. Because claim 19 does not actually require the use of the thick metallization layer, it does not further limit claims 17 and 18 and the thick metallization layer is not a required part of applicants' invention and therefore, does not have to be examined.

However, if applicants were to reword claim 19 to make the thick metallization layer a necessary component of their invention, Sugihara et al. (figure 3, 5-8; col. 7, lines 65-67; col. 8, lines 1-9) teach an electrode comprising an electrode in a cavity with that is filled with a thick metallization layer.

Therefore, it would have been obvious to one skilled in the art to include a thick metallization fill layer in the cavity of Urban et al. as taught by Sugihara et al. because a thick metallization fill layer is conductive, but will protect the electrode from the corrosive effects of ions such as chlorine and improve conductivity.

Regarding claim 24, since claim 19 specifically makes the thick metallization layer "optional" and not a specific limitation, claim 24 does not further limit claim 1 or claim 19. However, as stated above in claim 19, Sugihara et al. teach a thick metallization fill layer, while this layer is not flush with the top of the substrate, the layer fills the cavity. Applicant's specification does not provide any insight as to why the filling of the cavity to be flush with the substrate is essential.

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The Federal Circuit has held that, where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. *In Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), MPEP 2144.04 IV, A. Therefore, Sugihara et al. teach a cavity which is filled, whether the cavity is filled to be flush with the top or extends over the top will provide improved conductivity and protective ability against corrosive effects.

Regarding claim 25, since claim 19 specifically makes the thick metallization layer “optional” and not a specific limitation, claim 25 does not further limit claim 1 or claim 19. However, Urban et al. teach the use of having a thin film polymer filter membrane deposited over the electrodes (page 11) in order to filter out unwanted species.

Regarding claim 31, Urban et al. teach an electrode that meets the limitations specified in applicants’ main independent claim. Therefore, it is inherent that the electrode of Urban et al. has a thickness allowing it to constitute, around and above the microdisks, a confinement volume protected from a hydrodynamic flow of a solution to be treated.

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5. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Urban et al. and Sugihara et al. in view of Madou et al. (US 4,874,500).

Regarding claims 20 and 21, Urban et al. teach a thin metallization 1 comprising a metal such as platinum (page 11), but does not teach a multilayer formed from an adhesion layer and a conducting layer.

Madou et al. teach an electrochemical sensor in which the substrate is pierced and an electrode which is placed in the cavity. The substrate can be made of a conducting or nonconducting material. Madou et al. teach that if one were to choose to make a sensor from a conducting material, it is necessary to provide an appropriate insulating layer to prevent shorting through the substrate (col. 4, lines 25-43).

Additionally, Madou et al. teach that often the electrode, which can be platinum (col. 6, lines 28-35), will need additional backup layers, such as aluminum or titanium, for strength and/or economy (col. 6, lines 5-10).

Therefore, it would have been obvious to one skilled in the art to modify the electrode of Urban et al. to have a titanium adhesion layer and a platinum conducting layer as taught by Madou et al. because if one were to chose to make a sensor from a conducting material, it is necessary to provide an appropriate insulating layer to prevent shorting through the substrate and often the electrode will need additional backup layers, such as aluminum or titanium, for strength and/or economy (col. 6, lines 5-10).

6. Claims 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Urban et al. in view of Madore et al. (*Environmental Sensing Potential with Arrays*

of Boron-Doped Diamond Microdisk Electrodes, 4th International Symposium on New Materials for Electrochemical Systems, July 9-13, 2001, pages 23-25).

Regarding claims 26 and 27, Urban et al. teach an electrode for a sensor, but does not teach that the generator electrode 3 comprises a portion of diamond.

Madore et al. teach boron doped diamond electrodes (i.e. electrodes can comprise diamond). Madore et al. teach that diamond is particularly suitable for electroanalytical applications due to its wide working potential in aqueous electrolytes, low and stable voltammetric and amperometric background currents, chemical inertness, long-term response stability, and a wide working potential window (page 23; paragraph 3 and 5).

Therefore, it would have been obvious to one skilled in the art to modify the electrode in Urban et al. to be diamond as taught by Madore et al. because diamond is particularly suitable for electroanalytical applications due to its wide working potential in aqueous electrolytes, low and stable voltammetric and amperometric background currents, chemical inertness, long-term response stability, and a wide working potential window.

7. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Urban et al. and Sugihara et al. in view of Madore et al.

Regarding claim 28, see rejection above concerning claims 26 and 27.

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8. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Urban et al. in view of Madou et al. as evidenced by Butler (US 4,062,750).

Regarding claim 32, Urban et al. teach a sensor, but does not teach that the substrate is made of doped silicon.

Butler teaches a sensor in which the substrate is made of silicon made conductive by doping (col. 7, lines 58-64) because it provides low resistivity to provide a common ohmic contact to the electrode and adhesion layer.

Therefore, it would have been obvious to one skilled in the art to modify the substrate of Urban et al. to utilize doped silicon as taught by Butler because it provides low resistivity to provide a common ohmic contact to the electrode and adhesion layer.

Response to Arguments

Applicant's arguments with respect to claims 17-32 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer Dieterle whose telephone number is (571) 270-7872. The examiner can normally be reached on Monday thru Friday, 8am to 5pm (EST).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nam X Nguyen/
Supervisory Patent Examiner, Art Unit 1753

JMD
12/17/09